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Sandia National Laboratories, California Hazardous Materials Management Program Annual Report

January 2008

Mark E. Brynildson, Hazardous Materials Management Program Lead

Prepared by
Sandia National Laboratories
Livermore, California 94550

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Sandia National Laboratories, California Hazardous Materials Management Program Annual Report

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ABSTRACT

The annual program report provides detailed information about all aspects of the Sandia National Laboratories, California (SNL/CA) Hazardous Materials Management Program. It functions as supporting documentation to the *SNL/CA Environmental Management System Program Manual*. This program annual report describes the activities undertaken during the past year, and activities planned in future years to implement the Hazardous Materials Management Program, one of six programs that supports environmental management at SNL/CA.

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Tables

0 Summary of Document Changes

Significant changes made to this Hazardous Materials Management (HMM) Program Report are summarized in Table 1.

Table 1. Summary of Significant Changes to the Hazardous Material Management Program Report

Section	Page	Change
6.2	19	Updated metric data
6.3	20	Updated metric data
11.1	27	EMS Objective & Targets Updated
11.2	28	EMS Objective & Targets Updated
Table 6	22	Table 6 updated
Table 7	29	Table 7 updated
Table 8	30	Table 8 updated
Appendix B	32	Risk Assessment Updated
Appendix D	42	Annual update: Hazardous Materials Management Program Self Assessment

1 Program Description

1.1 INTRODUCTION

The HMM Program is one of six programs under the Environmental Management Department at Sandia National Laboratories, California (SNL/CA). The program applies to all projects and activities involving hazardous materials, excluding explosives and radioactive materials, at SNL/CA. The program is part of the corporate HMM Program know as the "Chemical Information System Program" at Sandia National Laboratories/New Mexico (SNL/NM) managed by the Industrial Hygiene Program Department (04127).

SNL/CA is responsible for tracking hazardous materials (chemical and biological hazardous materials), providing Material Safety Data Sheets (MSDS) and for regulatory compliance reporting according to a variety of hazardous material regulations. The principal regulations for hazardous materials tracking are the Emergency Planning Community Right-to-Know Act (EPCRA) and the California Right-to-Know regulations. The regulations, the Hazard Communication/Lab Standard of the Occupational Safety and Health Administration (OSHA) are also key to the HMM Program. The HMM Program is also responsible for supporting hazardous material safety and information requirements for a variety of Integrated Enabling Services (IES) programs primarily the Industrial Hygiene, Waste Management, Fire Protection, Air Quality, Emergency Management, Environmental Monitoring and Pollution Prevention programs.

The principal program tool is the Chemical Information System (CIS) that was completely redeveloped in a multi-year effort and put into production in December 2004. The system contains two key elements: the MSDS library and the hazardous material container tracking database that is readily accessible to all Members of the Sandia Workforce.

1.2 Material Safety Data Sheet (MSDS) Library

The MSDS library in CIS contains almost 90,000 MSDSs which is comprised of commercial MSDS documents and data supplemented with vendor specific MSDS images and data. The MSDS library is available on Sandia's unclassified internal/external web (login required) 24 hours a day, seven days a week with new MSDSs being added as available or by request. The CIS database and ES&H archives store MSDSs for a period of 75 years according to a DOE epidemiological record destruction moritorium requirement. Manufacturer-specific MSDSs are maintained for products if their MSDS is not available in the commercial library. Just-In-Time (JIT) vendors with contractual chemical tracking requirements are required to provide MSDSs to the HMM Program. Hazardous material users also send MSDSs that accompany their chemical shipments to the HMM Program as outlined in MN471001, ES&H Manual, Section 6U, "Chemical Barcoding and Inventory." In addition, the HMM Program request MSDSs from manufacturers as needed or utilize commercially available MSDS library references. MSDSs for new chemical mixtures can be authored in-house by request. The HMM Program processes MSDSs according to internal program procedures.

The web link for access to the MSDS library is:
http://cis.sandia.gov
The alternate web link for external/off-site access is:
https://webprod2.sandia.gov/CIS/svRemoteStartup

1.3 Hazardous Material Container Tracking Database

The CIS database tracks individual hazardous material containers with the use of unique hazardous material inventory barcodes. There are over 35,000 barcoded containers at SNL/CA distributed site-wide managed by nearly every SNL/CA organization. Each individual hazardous material container, as defined by ES&H Manual Attachment 6U-1 is barcoded and all relevant hazardous material inventory information is collected and entered in the CIS database. Information collected includes hazardous material or product name, vendor, storage location, quantity, hazardous material owner/requester information, and container storage information for regulatory reporting purposes.

This electronic inventory allows hazardous material users and Integrated Enabling Services (IES) professionals to assess and manage workplace hazards. CIS data is also key in completing annual federal and state regulatory reporting requirements. Easy access to this inventory facilitates quick availability searches, sharing of chemicals, source reduction, as well as minimizing hazardous material purchases and waste disposal expenses.

Hazardous material tracking in CIS is based on the premise that if the baseline inventory is known and all incoming and outgoing hazardous materials are tracked, the inventory will be up-to-date at any given time. All SNL sites complete annual wall-to-wall hazardous materials inventory reconciliation. One of the goals at SNL/CA is: improving database accuracy 1% each year. The SNL/CA 2007 reconciliation "found" percent was 93.5 % compared to 93.0 % in 2006.

Just-In-Time (JIT) gas products vendor, Matheson Tri-Gas barcodes all incoming gas products and forwards the hazardous materials inventory information to the HMM Program electronically. The HMM Program and/or Line hazardous material users are responsible for barcoding all other incoming hazardous materials (non-JIT purchases). Inventory information is then forwarded to the HMM Program using the corporate Chemical Inventory Incoming Form. Hazardous materials users are responsible for storage location changes if a chemical is used, disposed, or transferred to a new location. See MN471001, *ES&H Manual*, Section 6U, "Chemical Barcoding and Inventory," for responsibilities and procedures for chemical users. Hazardous materials tracking requirements are part of the contract requirements in the JIT vendor contract. The HMM Program processes inventory information according to internal HMM procedures.

2 Program Drivers

Compliance drivers include laws, regulations, orders, directives and other corporate and site-specific requirements. The drivers that are applicable to the HMM Program are listed in Table 1.

2.1 General Compliance

The HMM Program uses a variety of sources to stay current on applicable compliance drivers. The primary source used is the Sandia corporate notification service provided by the legal staff. Sandia legal monitors DOE requirements and federal, state, and local government publications for regulatory issues applicable to Sandia operations. These notifications are then reviewed for applicability to SNL/CA operations. The HMM Program also receives additional sources of information on regulatory changes include direct communication with DOE and regulating agencies, and periodic review of agency web sites. New requirements are incorporated into program activities and communicated to the site through electronic notifications, the ES&H Interdisciplinary Team process, self-assessments, targeted presentations and program documents.

DOE Order 151.1C *Emergency Management* was approved in 11/2005. This driver had significant impact to the HMM Program in 2006 and will for the forseable future. Executive Order 13423 *Strengthening Federal Environmental, Energy, and Transportation Management*, approved in 1/2007, is expected to impact the HMM Program in 2008.

The HMM Program is audited occasionally by DOE, Sandia Corporation, and Lockheed Martin, Sandia's parent company. Under California law, Alameda County Department of Environmental Health is required to audit the program every three years.

The HMM Program Lead communicates with DOE/NNSA/SSO (SSO) counterparts regularly to keep them informed of issues and trends of importance to the program. The HMM Program at SNL/CA work closely with our SNL/NM counterparts and DOE/NNSA/SSO to resolve concerns and to develop effective approaches to program implementation. The HMM Program and SSO maintain an open and cooperative relationship.

Table 2. Compliance Drivers for the Hazardous Material Management Program

Driver	Summary	Regulating Authority
Federal Laws and Regulations[a]		
40 CFR 300 - 372 Emergency Planning Community Right-to-Know (EPCRA)	The regulations provide for Emergency Planning, Emergency Notification, Community Right-to-Know Reporting and Toxic Chemical Release Reporting for hazardous chemicals at a facility.	EPA
29 CFR 1910.1200 Hazard Communication Standard (Worker Right-to-Know Rule)	OSHA's Hazard Communication Standard (HCS) is designed to ensure that information about these hazards and associated protective measures is disseminated to workers and employers.	OSHA
29 CFR 1910.1450 Lab Standard	The Standard outlines the strategy for laboratories to maintain employee exposures at or below the permissible exposure limits specified for the hazardous chemicals in 29 CFR part 1910, subpart Z.	OSHA
40 CFR 68 Risk Management Plan	Section 112(r) of the Clean Air Act focuses on the efforts to prevent the accidental release of chemicals and limit the consequenses of such releases.	EPA
Executive Orders (EO)		
Executive Order 12856, Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements	The order directs federal agencies and their facilities to comply with the provisions of EPCRA and the Pollution Prevention Act	DOE as responsible federal agency for SNL facilities
Executive Order 13423 Strengthening Federal Environmental, Energy, and Transportation Management	The order directs federal agencies and their facilities to a variety of things but the action directly relevant to HMM program is: Title 3, Section 2, (e) ensure that the agency (i) reduces the quantiry of toxic and hazardous chemicals and materials acquired, used, or disposed of by the agency, (ii) increases diversion of solid waste as approprite, and (iii) maintains cost-effective waste prevention and recycling programs in its facilities	DOE as responsible federal agency for SNL facilities
DOE Directives		
Order 450.1, Change 3, Environmental Protection Program / 2007	The order outlines the basic strategy for environmental compliance at DOE facilities, requires DOE facilities to implement an EMS that addresses protection of site resources and long-term stewardship of these resources	DOE
Order 151.1C, Emergency Management / 2005	The order outlines the basic strategy and requirements for the Emergency Management Program at DOE facilities. Emergency Management Hazards Surveys and Emergency Management Hazards Assessments	DOE

	(EPHAs) require extensive HMMP support.	
California Laws and Regulations[a]		
State of California, Hazardous Materials Release Response Plans and Inventory Law (AB 2185).	California Health and Safety Code requires businesses to provide information on hazardous substances	Alameda County Department of Environmental Health

[a] The effective date for federal and state regulations represents the most recent revision.

2.2 Requirements Source Documents

40 CFR 300-372 Emergency Planning and Community Right-to-Know Act (EPCRA)

The Emergency Planning and Community Right-to-Know Act (EPCRA), enacted on October 17, 1986, represents a significant first step toward a major federal role in areas previously regulated by state and local governments. EPCRA was enacted by Congress as a stand-alone provision, Title III, of the Superfund Amendments and Reauthorization Act of 1986 (SARA).

SARA Title III (EPCRA) was passed in response to concerns regarding the environmental and safety hazards posed by the storage and handling of toxic chemicals. These concerns were triggered by the disaster in Bhopal, India, in which more than 2,000 people suffered death or serious injury from the accidental release of methyl isocyanate. To reduce the likelihood of such a disaster in the United States, Congress imposed requirements on both states and regulated facilities. Facilities must notify the local emergency planning districts regarding materials stored at and released from sites.

EPCRA contains three subtitles. Subtitle A, Emergency Planning and Notification, establishes mechanisms to enable states and communities to prepare to respond to unplanned releases of hazardous substances.

Subtitle B, Reporting Requirements, contains three distinct reporting provisions concerning two different groups of chemical substances. The first two sets of reports require submission of inventory-related data on hazardous chemicals [i.e., those substances for which a Material Safety Data Sheet (MSDS) is mandated under the hazard communication regulations of the Occupational Safety and Health Administration]. The third reporting provision requires annual reporting to EPA and the state in which the reporting facility is located on environmental releases of listed toxic chemicals manufactured, processed, or otherwise used at the facility in excess of specified threshold quantities.

Subtitle C, General Provisions, contains a variety of provisions, including, but not limited to, civil, criminal, and administrative penalties for violations of the statute's reporting requirements; enforcement actions that can be brought by citizens, states, and emergency planning and response entities; and restrictions on an owner's or operator's rights to make trade secrecy claims in the reports required by EPCRA.

Appendix A of 40 CFR 355 defines extremely hazardous substances. Any DOE facility that manages any such substances in quantities exceeding the Threshold Planning Quantities noted in the appendix must comply with EPCRA.

Under 40 CFR 355 facilities must notify the emergency response commission that they are subject to these requirements. The facilities must notify the local emergency planning unit of releases exceeding a Reportable Quantity (RQ) of Extremely Hazardous Substances, as defined under Title III, and Hazardous Substances, as defined under CERCLA. In addition, the facilities must report their chemical inventories and provide MSDSs to the local emergency planning organizations as outlined in 40 CFR 370.

29 CFR 1910.1200 Hazard Communication Standard.

Chemicals pose a wide range of health hazards (such as irritation, sensitization, and carcinogenicity) and physical hazards (such as flammability, corrosion, and reactivity). OSHA's Hazard Communication Standard (HCS) is designed to ensure that information about these hazards and associated protective measures is disseminated to workers and employers. This is accomplished by requiring chemical manufacturers and importers to evaluate the hazards of the chemicals they produce or import, and to provide information about them through labels on shipped containers and more detailed information sheets known as MSDSs. All employers with hazardous chemicals in their workplaces must prepare and implement a written hazard communication program, and must ensure that all containers are labeled, employees are provided access to MSDSs, and an effective training program is conducted for all potentially exposed employees.

29 CFR 1910.1450 Occupational Exposure to Hazardous Chemicals in Laboratories (Lab Standard).

The standard entitled "Occupational Exposure to Hazardous Chemicals in Laboratories" (§ 1910.1450; the "Standard") applies to laboratories that use hazardous chemicals in accordance with the Standard's definitions for "laboratory use of hazardous chemicals" (2) and "laboratory scale." (3) The Standard requires these laboratories to maintain employee exposures at or below the permissible exposure limits specified for the hazardous chemicals in 29 CFR part 1910, subpart Z. At SNL/CA this is implemented by the Industrial Hygiene Program in Section 6E of the ES&H Manual "Laboratory Standard - Chemical Hygiene Plan" (CHP) that describes: Standard operating procedures for using hazardous chemicals; hazard-control techniques; equipment-reliability measures; employee information-and-training programs; conditions under which the employer must approve operations, procedures, and activities before implementation; and medical consultations and examinations. The CHP also designates personnel responsible for implementing the CHP, and specifies the procedures used to provide additional protection to employees exposed to particularly hazardous chemicals.

Other information-collection requirements of the Standard include: Documenting exposure-monitoring results; notifying employees in writing of these results; presenting specified

information and training to employees; establishing a medical-surveillance program for overexposed employees; providing required information to the physician; obtaining the physician's written opinion; using proper respiratory equipment; and establishing, maintaining, transferring, and disclosing exposure-monitoring and medical records. These collection-of-information requirements, including the CHP, control employee overexposure to hazardous laboratory chemicals, thereby preventing serious illnesses and death among employees exposed to such chemicals.

Executive Order 12856, Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements

Executive Order 12856 published August 6, 1993, 58 FR 41981, directs federal agencies and their facilities to comply with the provisions of EPCRA. Thus, all DOE facilities, including national laboratories, research facilities, power administrations, and petroleum reserves, are potential reporters under EPCRA, if they meet any reporting thresholds.

Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management

FR Vol. 72, No. 17 published Friday, January 26, 2007 Title 3, Section 2, (e) ensure that the agency (i) reduces the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of by the agency, (ii) increases diversion of solid waste as appropriate, and (iii) maintains cost-effective waste prevention and recycling programs in its facilities.

State of California, Hazardous Materials Release Response Plans and Inventory Law (AB 2185).

The California legislature passed Assembly Bill 2185 in 1987, incorporating the provisions of SARA Title III into a state program. The legislature delegated implementation of emergency planning and community-right-to-know programs to the state Office of Emergency Services (OES). OES has in turn authorized local government agencies to implement the program. The Alameda County Department of Environmental Health is responsible for AB 2185 oversight at Sandia/CA.

AB 2185 has been codified in state law as Chapter 6.95 of the California Health and Safety Code. The chapter requires that Sandia/CA complete an annual inventory or “Business Plan” listing specified hazardous materials.

What Chemicals Need to Be Listed On The Inventory? Section 25501.1 of the California Health and Safety Code requires businesses to provide information on all hazardous substances on the federal Environmental Protection Agency (EPA) list at Title 49, Parts 172 and 173 of the Code of Federal Regulations. This list essentially duplicates the class of materials for which a MSDS must be produced. Thus, any chemical for which an MSDS had been produced is considered reportable under Chapter 6.95. Additionally, state law requires that businesses list materials classified as hazardous wastes on the annual inventory.

2.3 Implementing Documents

SNL, MN471001, *ES&H Manual*, Section 6U, *Chemical Barcoding and Inventory*.

2.4 Related Documents

SNL, *Chemical Safety Vulnerability Review Management Response Plan*, May 27, 1994.

SNL, GN470094, *Handling Chemicals at SNL/CA*.

SNL, MN471001, *ES&H Manual*, Section 6D, *Hazard Communication*.

SNL, MN471001, *ES&H Manual*, Section 6E, *Laboratory Standard*.

DOE-HDBK-1139/1-2006 September 2006 *Chemical Management Volume 1 of 3*

DOE-HDBK-1139/2-2006 August 2006 *Chemical Management Volume 2 of 3*

DOE-HDBK-1139/3-2005 April 2005 *Chemical Management Volume 3 of 3*

3 Operational Controls

3.1 HMM Program Operational Controls

The HMM program uses technical work documents, administrative and engineered controls, and specialized equipment as operational controls. Table 2. lists the technical work documents applicable to the program. They include the corporate ES&H manual and a Primary Hazards Screening (PHS) document.

The summer reconciliation is another operational control implemented to improve the quality of the inventory data and capture information about hazardous materials not encountered in the primary receiving process. Additional information on the reconciliation is found in Section 7.2

3.2 Additional Operational Controls

Additional controls are owned by the Corporate and Strategic Purchasing Department at SNL/NM and the Logistics and Procurement Department at SNL/CA. These controls include a Just-in-Time purchasing contract with Matheson Tri-Gas for gas products, a site exemption to procure hazardous materials using a corporate procurement card (ProCard) expired 3/1/2007. An updated procurement process was introduced in 2/2007 to better control hazardous material procurement. The BioReceiving process, under redevelopment, manages biohazardous materials as they are ordered, received, barcoded and delivered to the customer. This redevelopment effort has been delayed due to the departure of the BioReceiving Redevelopment Lead, Susan Weekly, BioSafety Officer. The new BioReceiving process will be a component of the Biological Use Authorization (BUA) process owned by the BioSafety Program in the Health and Safety Department, 08517. It will be determined in 2008 how to proceed with this effort due to BioSafety program personnel changes.

In the early 1990's, an effort to improve the procurement process for low cost items, including hazardous materials, was introduced at SNL/CA. This process utilized the corporate procurement credit card that allowed select site personnel to directly order hazardous materials from suppliers. While this greatly streamlined the purchasing process of the low cost items, it relaxed a number of operational controls including the ES&H/Industrial Hygiene review of all hazardous materials purchase orders. A post receiving approval process was implemented through automatic e-mail notifications to Industrial Hygiene and other interested parties. This has provided adequate notification of all items newly received on-site and entered into the CIS database.

Table 3. Technical Work Documents Applicable to the HMM Program

Title	Current Version
ES&H Manual Section 6U Chemical Barcoding and Inventory	12/14/2007
PHS SNL0A00433-011 Hazardous Material Management Program at SNL/CA	10/23/2007

4 HMM Program Documents and Reports

Table 4. Documents Produced

Document	Due Date	Frequency of Submittal	Distribution	Purpose
EPCRA 302, 311 and 312 Reporting	March 1	Annual	DOE/NNSA/SSO, EPA, Alameda County and LLNL Fire Department	Regulatory requirement
EPCRA 313 Toxic Release Inventory (TRI) Form R	July 1	Annual	DOE/NNSA/SSO and EPA	Regulatory requirement
California Hazardous Material Business Plan	March 1	Annual	DOE/NNSA/SSO and Alameda County	Regulatory requirement
Chemicals New To Room Report	NA	Monthly	Line/IH/Medical/HMMP	IES/Line Operations
Chemicals >= 55 Gallons Per Storage Room Report	NA	Quarterly	HMMP	IES Operations
Toxic Gas Report	NA	Quarterly	HMMP	IES Operations
Cyanide Report	NA	Quarterly	IH/Medical/HMMP	IES Operations
Expiration Date Report	NA	Quarterly	HMMP	IES Operations
EOC Emergency Response Report	NA	Monthly	Emergency Management/HMMP	IES Operations
SNL/CA Air Quality Chemical Received Report	NA	Monthly	Air Quality/HMMP	IES Operations
SNL/CA Bay Area Toxic Air Chemical Received Report	NA	Monthly	Air Quality/HMMP	IES Operations
SNL/CA Deuterium Inventory Report	NA	Monthly	SNM Management/ HMMP	IES Operations
SNL/CA Deuterium RECEIVED Report	NA	Monthly	SNM Management/ HMMP	IES Operations
SNL/CA Maintenance Adhesives Disposal Report	NA	Monthly	Air Quality/HMMP	IES Operations
SNL/CA Peroxide Report	NA	Monthly	HMMP	IES Operations
SNL/CA Solvent Disposal Report	NA	Monthly	Air Quality/HMMP	IES Operations
SNL/CA Weekly Disposal Report	NA	Weekly	HMMP	IES Operations
SNL/CA Weekly Purchase Report	NA	Weekly	IH/Security/HMMP	IES Operations

5 Approved Job Descriptions, Qualifications and Job Specific Training

5.1 Program Staffing

The HMM Program personnel consists of the Program Lead, an HMM Technologist and two part-time Student Interns. A description and associated responsibilities for each position are described below. Current assignments to these positions are found in Appendix A.

5.2 Program Lead

The HMM Program Lead is responsible for managing and overseeing operations, administering permits, reporting requirements and developing special program activities as needed. The program lead also directs the activities of the HMM Technologist who in turn directs the activities of the Student Interns in the program. Primary duties include interpretation of technical/scientific requirements in federal and state laws, regulations, and orders as they apply to hazardous materials management practices; advises management, makes recommendations. Guides the development of hazardous materials management tools (Chemical Information System) and procedures to ensure that these practices are in compliance with the appropriate statutes and regulations, and that regulatory reporting requirements are met. The Program Lead also supports other IES programs on hazardous materials management related activities. In support of these primary duties, the Program Lead sees that Line organizations have knowledge and the tools to effectively manage their hazardous materials. Additional activities include general hazardous material consulation for ES&H programs and the IES Interdiscplinary Team (IDT). The Program Lead also supports the Emergency Mangement Hazards Screening/Hazards Assessment Team and serves as the "Chemical Hazards SME" for the Emergency Management Program.

5.3 Program Technologist

The HMM program efficiently collects and manages hazardous material information for the line, regulators, DOE, and ES&H customers. This technologist provides assistance to customers, prepares regulatory compliance reports, performs data, Line and Program quality assurance and manages the Material Safety Data Sheets (MSDS). The HMM Technologist also serves as the lead in the annual chemical reconciliation, supervises student interns, and manages day-to-day operations for the HMM Program. An additional duty includes serving as a back-up for Emergency Spill Response Team in the Waste Management Program.

5.4 Student Intern

The Student Intern position has three main components: hazardous material inventory reconciliation and data collection and data entry. During the lab and other field work, Student Interns work under the direct supervision of the HMM Technologist. During reconcilation they visit every hazardous material storage location and scan the barcodes on the hazardous materials containers, add barcodes and collect all relevant hazardous material data. The computer data

entry portion involves entering data collected from the field and entered into the CIS. A additional component of the position entails answering calls from customers, entering information from MSDSs, locating MSDSs, and analyzing and manipulating data.

Required Training/Competency:

Student Interns must have a positive attitude and good oral and written communication skills. Prior experience in other service organizations is desired but not required. Interns must have experience working in a chemical laboratory environment and must be an independent and self-motivated worker. Additional required skills include general computer experience and high school chemistry coursework. Must have a GPA greater than 3.2.

Table 5. HMMP Program Training Matrix

Training Requirement	Training Method	Program Lead	Program Technologist	Student Intern
Advanced degree in chemistry or related physical/biological science	Graduate degree	O	O	N
Bachelor's degree in chemistry or related physical/biological science	Bachelor's degree	R	O	N
Associates of Arts/Science degree in chemistry or related physical/biological science	AA/AS degree	O	R	N
Hazardous Materials Manager Certification	HMM Certificate program	O	O	N
40-hr HAZWOPPER certified	Off-site classroom	R	R	N
FRP106 Fire Extinguisher Training Hands-on	SNL classroom	R	R	N
MED104CA Adult CPR and Automated External Defibrillator for Non-Medical Personnel	SNL classroom	R	R	N
MED113 Blood Borne Pathogens Training for Non-Medical Personnel	SNL classroom or on-line	R	R	N
ESH100 ES&H Awareness	SNL classroom or on-line	R	R	R
HAZ101 Employee Basic Hazard Communication Training	SNL classroom or on-line	R	R	R
HAZ103 Site Specific Hazard Communication Training	SNL classroom or on-line	R	R	R
RAD102 General Employee Radiological Training	SNL classroom or on-line	R	R	R
ENV203CA Spill Prevention Control and Countermeasures Plan	SNL classroom or on-line	R	R	N

R = required, O = Optional, N = Not Required

6 Performance Measures

6.1 Regulatory Reporting

Regulatory reporting will be completed as prescribed in Table 5. HMM Program Documents and Reports.

6.2 Annual Hazardous Material Inventory Reconciliation "Found" rate

The annual hazardous material inventory reconciliation "found" rate performance target is greater than or equal to 90%. In 2006, the HMM Program achieved the highest reconciliation "found rate" of 93% in the ten years the HMM Program has been doing an annual hazardous material inventory reconciliation. This exceeds the corporate performance target (90%). Figure 1. Illustrates the "found" rate performance over the last decade and shows steady progress toward a rate consistently in the low 90% range. Although improvement is desired, additional resources are needed (or redirecting existing resources) to increase Line education, increase data surveillance and improve site business processes to achieve improved results.

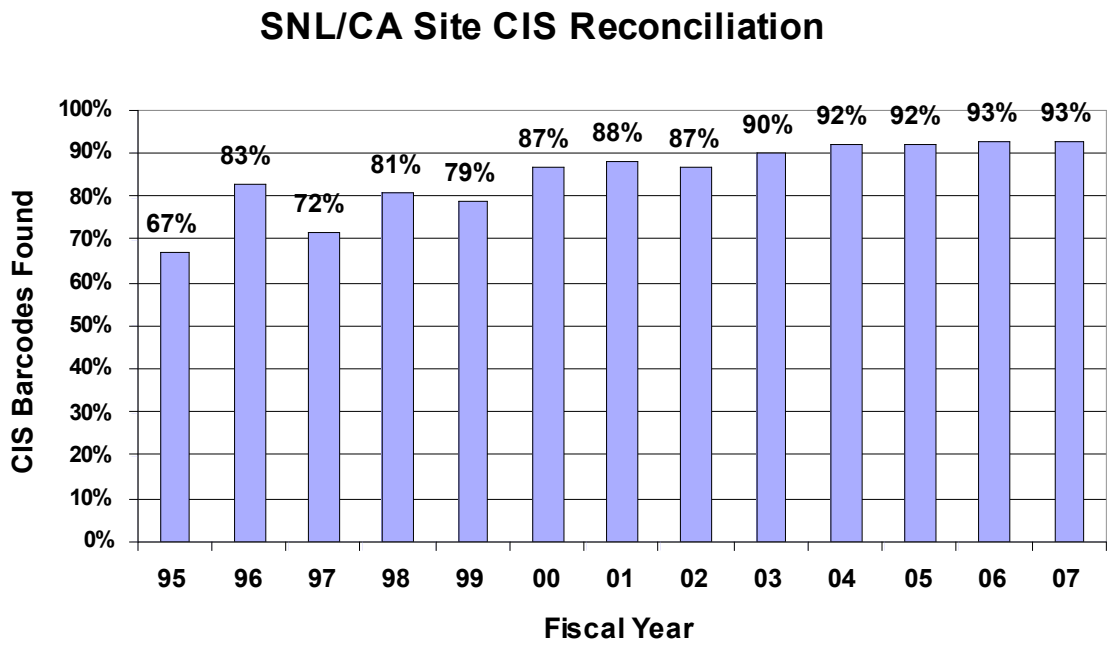

Figure 1. Annual Hazardous Material Inventory Reconciliation "Found" Rate.

6.3 Annual Hazardous Material Inventory Container Count

Figure 2. Illustrates the total site hazardous material container count and the site container count of NFPA Health 3 & 4 rated materials. The general trend observed from the first site inventory in 1993 until 2002 was a doubling of the total container count. Some of the increase was due to the improvement of the inventory process to account for more containers but the majority of the increase was likely due to the implementation of the Waste Management chargeback. The chargeback process require waste generators to directly pay a portion of the cost of disposal in an effort to encourage waste minimization. The chargeback likely resulted in excessive inventories as generators avoided disposal costs and waste generation by keeping unnecessary material in inventory. Thus, the chargeback works as a disincentive to reduce hazardous material inventory, essentially deferring waste disposal and requiring periodic campaigns to "rightsize" the hazardous material inventory.

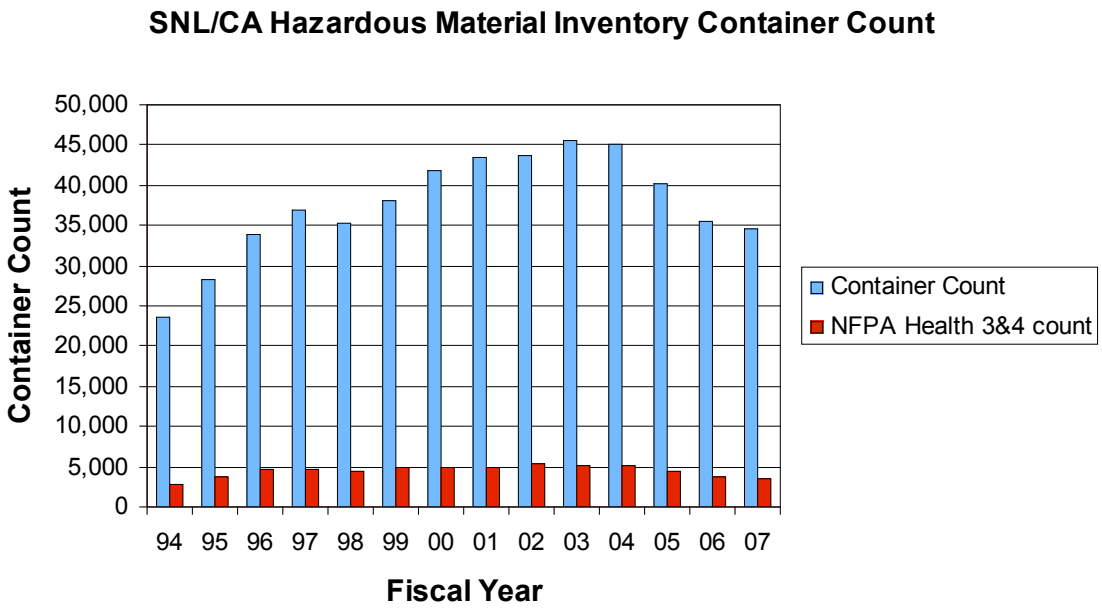

Figure 2. Annual Hazardous Material Inventory Container Count

7 Quality Assurance

7.1 Data and Reporting Quality Assurance

The HMM Program applies the following program-specific elements to assure quality is maintained in data collection, analyses, and reporting.

- Online and hardcopy validation tools, screens and forms ensure that a standard process is followed for collection and management of inventory data.
- All data input is reviewed for accuracy after the input is complete.
- All regulatory lists are periodically reviewed and updated.
- Internal reports and documents are subjected to internal review and technical editing before finalizing.
- DOE/SSO, applicable SNL/CA staff and technical editor's review published reports before finalizing.

7.2 Annual Hazardous Material Inventory Reconciliation

Summer reconciliation is a quality assurance process where a team of student interns is led by the HMM technologist.

- The reconciliation uses portable barcode readers to find all barcoded containers on-site.
- Reconciliation results are e-mailed to the location owners for verification.
- Location ownership is verified with the annual reconciliation.

7.3 Additional Assurance Activities

- Requested ad hoc reconciliations/transfers of hazardous material inventory are performed to assure data quality.
- Ad Hoc e-mail notification is provided to inform the resigning, retiring, or terminated employee's manager that that person was or has been responsible for specific locations and/or hazardous materials. This ensures that the ownership of inventory is up-to-date.

7.4 Program Risk Assessment

In January 2008, the HMM Program updated a risk assessment (Appendix B) as part of the decision making process to determine the appropriate level of formality required for Program activities and identified seven potential risks related to program activities. Table 6 lists each risk and the calculated risk category. The overall risk for HMM Program issues were determined to be medium. Measures taken by the HMM Program to mitigate this risk are 1) routine HMM personnel training, 2) maintaining operational controls, 3) improve processes and systems (CIS) and 4) Line training.

Table 6. Hazardous Materials Management Program Risks 2007

Risk #	Risk	Overall Risk Category
1	Hazardous materials not being tracked in CIS	low
2	Aging chemicals or containers	medium
3	Hazardous materials misidentified in CIS	low
4	Storage incompatibility	medium
5	Excess inventory	medium
6	Site-wide Earthquake Induced Spill or Accident	low
7	Reduction of program funding by 10%	medium
8	Regulatory Noncompliance	low

For the low risk category for Risk 1, the hazardous materials not being tracked are usually the result of local procurement and site personnel not obtaining a barcode for the container. The risk is minimized by the summer inventory reconciliation, additional Line training of their barcoding responsibilities and tighter procurement controls restricting local purchasing.

In response to the medium risk category for Risk 2, the risk is minimized by the inventory reduction campaigns and targeted chemical safety surveillance of the peroxidizable/autopolymerizable materials.

For the low risk category for Risk 3, updating incorrect data as it is observed minimizes the risk.

For the medium risk category for Risk 4, correcting problems observed during a variety of Line assessment processes minimizes the risk.

For the medium risk category for Risk 5, the risk mitigation is addressed by an explicit EMS goal for 2007.

For the low risk category for Risk 6, the risk is minimized by correcting problems observed during a variety of Line assessment processes and through inventory reduction.

For the medium risk category for Risk 7, the risk is minimized by a review of program activities that could be streamlined. A 10% reduction in program funding would result in decreased staffing, training, and purchases. Only those program activities that are required by regulation, Sandia policy, technical work documents, or DOE/NNSA would be conducted. Discretionary training and travel for program staff would be eliminated. Purchases for replacement equipment and equipment repair would be reduced. A reduction in Line training and support would occur.

For the low risk category for Risk 8, the hazardous materials in the form of Lead Acid Batteries in UPSs and equipment battery banks not being tracked was the result of mischaracterizing these batteries as non-reportable (exempted) articles. Now that these batteries are in CIS, the risk of underreporting is minimized.

7.5 Quality Significant Purchases Determination

A Quality Significant Purchases Determination, Appendix C, has been completed in accordance with the Environmental Management Quality Assurance Program Plan. The HMM Program does not have any quality significant items.

8 Program Assessments

8.1 Follow-up on the 2006 Program Self-Assessment

The 2006 Program Self Assessment identified issues with Line under-compliance with requirements and HMM Program documents out-of-date. The 2007 Program Self Assessment showed considerable improvement in up-to-date documentation. Line under-compliance continues to be identified in EP Rep. Assessments and site Management Self Assessments. Activities in 2007 included additional training for the Line as new procedures were introduced due to corrective actions at SNL/NM.

8.2 2007 Program Self-Assessment

The HMM Program participates in a routine schedule for program assessment with the corporate CIS program at SNL/NM. A formal corporate program assessment with Organization 12870, ES&H, Quality, and Safeguards & Security Audits Department, occurred during October – December 2007. The Lead Auditor was Richard Bild. The audit closeout on 12/5/2007 reported the Corporate Chemical Information System (CIS) Program to be "Satisfactory - No issues found, or one or more isolated occurrences of minor issue". The final report has not been released but the draft report indicated there was only on minor issue, 5 comments and 4 Noteworthy Practices. This audit and associated corrective action plan will be tracked independently in CATS.

The 2007 HMM program self-assessment was completed in December 2007. The program self-assessment is included in Appendix C.

8.3 Line Performance Assessment

The 2007 HMM line performance assessment data collection was completed as part of the summer inventory reconciliation. This assessment included a review of CIS Location Inspection Checklists and the inventory containers statistics developed for the inventory reduction campaign.

Evaluation of the line hazardous material storage locations showed that the majority of the areas on-site had minimal problems. The two areas of concern in the Line performance assessment were the number of unbarcoded containers observed in hazardous material storage locations and the disorganized condition of stored hazardous materials in sheds. Additionally, the hazardous material inventory is excessive in some locations and not always being properly rotated. The

hazardous material storage sheds in particular are often not properly organized. Supplemental education for the Line organizations focusing on minimizing inventory, rotating hazardous materials stock and maintaining an organized hazardous material location should support the improvement required to maintain the inventory and reduce potential risks to personnel.

No findings were identified during this Line performance self-assessment.

8.4 Environmental Programs Representative Assessment

The year-round Environmental Programs Representative (EP Rep.) assessment led by the Division 8000 EP Rep. at Sandia/CA, Deanna Dicker, reports issues to the Hazardous Material Management Program Lead. If necessary, Line Self-Assessment findings are issues. See section 8.5 for the findings HMM program findings issued since they are not reported separately.

8.5 Corporate Line Self Assessment

The year-round corporate Line self assessment team led by the 8000 Division ES&H Coordinator at Sandia/CA issued 5 HMM program related findings for missing barcodes on hazardous material containers. These findings were all resolved by barcoding the containers soon after the finding were issued.

9 Accomplishments

9.1 System Upgrades

The HMM Program used the newly redeveloped CIS in year-round for the third full calender year in 2007. This came after a multi-year redevelopment of the CIS and that went into production corporate-wide on December 13, 2004. The redevelopment of the CIS software addressed many needs for SNL. The software was developed and is supported by Corporate Computing organizations and is therefore well integrated into SNL ES&H and other general corporate business systems. Overall performance was greatly improved in all aspects (application speed, feature set, usability, customizability and supportability). Many new system tools are available that will allow SNL to improve the customer ease-of-use, accuracy of the hazardous materials inventory, improve the efficiency of regulatory reporting and improve the availability of required Material Safety Data Sheet information. During 2007, a number of new features and reports were added to the CIS software as part of the continuous improvement process in the HMM program. 2007 also included upgrades to improve accuracy of the data with a new Incoming Inventory Verification process and a monthly Emergency Management Highly Hazardous Validation Process.

9.2 Inventory Reconciliation

The HMM Program performs an annual hazardous material inventory reconciliation during the Summer months. In 2007, the HMM program team surpassed the highest “found rate” with a 93% rate. This exceeds the corporate performance target (90%). Hazardous material inventory process improvements, part of other goals, should result in a gradual improvement in the “found

rate". Therefore, no specific tasks are proposed to increase the "found rate" and the performance target (90%) remained the same in 2007.

9.3 Inventory Reduction

After nearly a year of effort concluding on 10/1/2007, the SNL/CA Center 08700 site exceeded the center-wide target (20%) with a **29% reduction** of the NFPA Health Hazard Rated 3 or 4 rated chemicals >10 years old. This effort was designed to reduce the oldest and most toxic materials.

9.4 Emergency Management - Hazards Survey & EPHA

A Hazards Survey compliant with DOE O 151.1C was conducted by AlphaTRAC for the SNL/CA Emergency Management Program, July 2006 – October 2006. This effort was supported by the HMM Program through a site tour and data reviews. The Hazards Survey indicated that SNL/CA needs to conduct Emergency Planning Hazards Assessments (EPHAs) for 961/9611 and 968 to further assess the hazards of concern to the Emergency Management Program. In 2007, the HMM program supported the Emergency Planning Hazards Assessments lead by the Emergency Management Program and their contractor AlphaTRAC.

10 Program Trends

10.1 Opportunities

The HMM Program's greatest opportunity came from the implementation of the modernized CIS software. In 12/2004 the team introduced a robust set of tools in the new CIS software that allow for much greater effectiveness in the management of the hazardous material inventory. These tools also provide an unprecedented opportunity to gather information about the inventory. This information can be used principally by the ES&H Subject Matter Experts (SMEs) to manage their programs more effectively. One example of this is the Emergency Planning Community Right-to-Know Toxic Release Inventory (TRI) reporting. The new CIS can provide information so effectively that the effort to prepare the TRI report is extensively reduced saving tens of thousands of dollars per year. Hazards assessments can also be done in a fraction of time saving resources. The Line can more effectively access their inventory and associated material safety data to minimize purchasing and waste disposal costs while reducing personnel potential exposure to hazardous chemicals. To take advantage of these opportunities addition training needs to be provided to the Line and ES&H SMEs. Only when personnel see the tools available to them will they begin to take advantage of the innovation inherent in the new CIS. The CIS continues to be upgraded with additional features and bug fixes. 2007 will include a significant set if new features to enhance the accuracy of the data and require accountability of the Line.

10.2 Political/Regulatory/Legal Trends

Prior to 9/11/2001, hazardous material inventories were considered necessary for operations and regulatory reporting. However, post 9/11/2001, there has been a renewed interest in the importance of hazardous material inventories especially from the risk of hazardous material

related terrorism. The concern of misused hazardous materials also is focused on drug and drug precursor materials with new regulations complicating the purchasing process of some materials. The DOE is especially concerned in the area of Hazards Surveys and Hazards Assessments for Emergency Management programs and the health affects of hazardous materials such as beryllium and NFPA Health 3 and 4 rated material. DOE at various levels from DOE HQ to DOE/NNSA/SSO have begun to raise the concern that chemical management throughout the DOE complex needs to be improved to meet operational needs and Emergency Management planning requirements. Sandia is addressing these concerns through an Issues Management Team at SNL/NM focused on chemical management. This should result in a variety of improvements to CIS in 2008.

10.3 Vulnerabilities/Failures

The success of hazardous material inventory management at SNL/CA depends on hundreds of personnel performing a variety of tasks to maintain the required accuracy of the information. This is an ongoing struggle because inventory management is not the primary activity of Line personnel. Hazardous materials that are consumer commodities are routinely purchased from local stores and brought on-site. Since these items do not go through receiving, the Line is required to notify the HMM program for barcoding service. The Line frequently fails to notify the HMM program when they purchase these items, however, the containers are barcoded when they are found in the summer reconciliation. Ongoing effective training and monitoring of the data is required to maintain the desired data quality objectives of the information. A variety of improvements to CIS were implemented in 2007 addressing some of these vulnerabilities and system failures.

10.4 Funding Projections

ES&H general funding projections for FY 2008 are for zero baseline increase and zero increase for inflation. As labor costs increase a shortfall is likely. The HMM program has no independent budget but is funded by a matrix of funding sources with primary funding coming from the Industrial Hygiene budget (~ 1.25 FTE). Significant secondary funding comes from the Waste Management Program (~ 0.25 FTE). Additional minor funding (0.1 FTE) is provided from the SNL/NM CIS Program for technical support.

No significant purchases are required apart from minor desktop software upgrades for Calendar Year 2007. Travel and training costs are usually minimal at < $6,000 per year.

The Alameda County Department of Environmental Health, the site Certified Unified Program Agency (CUPA), annually bills Sandia ~$35,000 September 1. This fee is based on the amount of hazardous materials reported on the Business Plan submitted by SNL/CA in the preceding February. The funds for this bill have come from the HMM portion of the Industrial Hygiene budget.

11 Goals and Objectives

The HMM Program is subject to internal goals and objectives established by Sandia's Integrated Enabling Services Strategic Management Unit and by SNL/CA's EMS Program.

The primary goal of the HMM Program is to ensure safe and effective hazardous materials inventory management at Sandia/CA. This is done by efficiently collecting and managing hazardous material information for our customers who include Line, regulators, DOE and ES&H programs to ensure compliance with regulations and to streamline customer business processes that require hazardous material information.

For FY 2007, the HMM program established the following goals found in Table 7 and for FY 2008, the HMM program established the following goals found in Table 8.

11.1 General Environmental Management EMS Objectives and Targets

2008 General Environmental Operations……..

Objective: Provide exceptional environmental management for the SNL/CA site.

Targets:

- Receive zero findings per audit per environmental program as the result of annual DOE audits.
- Receive no more than 2 minor non conformances as a result of ISO14001 certification audits.
- Receive no Notices of Violation (NOVs) as a result of any external regulatory agency audit.
- Maintain a level of published environmentally-related communications at 6 per month (total of 72/FY).
- Maintain a level of environmentally-related outreach activities at 4 per month (total of 48/FY).
- By the end of FY2010 achieve a 20% increase in the EMS awareness survey average score from an FY2008 baseline.

11.2 Hazardous Materials Management Specific EMS Objectives and Targets

2007 Hazardous Material……

Objective: Minimize the use of hazardous material.

Targets:

- Maintain an annual overall chemical inventory reconciliation of >90%. (We achieved 93% for FY2006)
- In FY07 reduce Center 8700 hazardous material container inventory by weight of NFPA health 3 and 4 chemicals greater than 10 years in age by 20% from the Oct. 1, 2006 baseline.
- By the end of FY10 achieve an annual chemical inventory reconciliation of NFPA health category 3 and 4 materials of >98%.

2008 Hazardous Material (Significant Aspect)……

Objective: Minimize the use of hazardous material.

Targets:

- Maintain an annual overall Chemical Information System reconciliation of >90%. (We achieved 93% for FY2007)
- In FY08 achieve an annual Chemical Information System reconciliation of 100% for the NFPA 704 health hazard rated 4 materials greater than 10% of laboratory scale quantities (4 lbs solid, 0.5 gal liquid, 1 lb gas).
- In FY08, reduce the SNL/CA site gas cylinder inventory by 10%, based on the container count, from the Oct. 1, 2007 baseline. (from 1856 to 1670 cylinders)

Table 7. 2007 EMS Objectives, Targets and Actions Supporting HMM Program Elements

Objective	Target	2007 Action Items	Status for 2007
Provide exceptional environmental management for the SNL/CA site	Receive zero findings per audit per environmental program as the result of annual DOE audit and any external regulatory agency audits.	Incorporate program assessment corrective actions into HMM Program	Received 1 finding from the Lockheed Martin Audit
	Receive no Notices of Violation (NOV) as a result of any external regulatory agency audit.	Incorporate program assessment corrective actions into HMM Program	Completed
	Maintain a level of department published environmentally-related communications at 6 per month (total of 72/FY). Approximately 50% should be related to line activities/operations.	Provide published environmental communications (1 Communicator article submitted and 6 TNT messages).	Completed
Minimize the use of hazardous material.	In FY2007 reduce Center 8700 hazardous material container inventory by weight of NFPA health 3 and 4 chemicals greater than 10 years in age by 20% from the Oct. 1, 2006 baseline.	Lead an 08700 campaign to reduce 10 year old inventory of NFPA Health 3&4 chemicals	Completed
	Maintain an annual overall chemical inventory reconciliation of >90%	Update HMM processes to maintain or improve the reconciliation "found rate"	Completed
	By the end of FY10 achieve an annual chemical inventory reconciliation of NFPA health category 3 and 4 materials of >98%.	Implement a CIS surveillance process to improve the accuracy of NFPA Health 3 & 4 materials	In Progress

Table 8. 2008 EMS Objectives, Targets and Actions Supporting HMM Program Elements

Objective	Target	2008 Action Items	Status for 2008
Provide exceptional environmental management for the SNL/CA site	Receive zero findings per audit per environmental program as the result of annual DOE audits.	Incorporate program assessment corrective actions into HMM Program	In Progress
	Receive no more than 2 minor non conformances as a result of ISO14001 certification audits.	Incorporate program assessment corrective actions into HMM Program	In Progress
	Receive no Notices of Violation (NOV) as a result of any external regulatory agency audit.	Incorporate program assessment corrective actions into HMM Program	In Progress
	Maintain a level of department published environmentally-related communications at 6 per month (total of 72/FY)..	Provide published environmental communications (1 Communicator article submitted and 12 TNT/email messages).	In Progress
	Maintain a level of department department environmentally-related outreach activities at 4 per month (total of 48/FY)..	Provide outreach activities	In Progress
Minimize the use of hazardous material.	In FY08 achieve an annual Chemical Information System reconciliation of 100% for the NFPA 704 health hazard rated 4 materials greater than 10% of laboratory scale quantities (4 lbs solid, 0.5 gal liquid, 1 lb gas).	Implement a CIS process to improve the accuracy of NFPA Health 3 & 4 materials	In Progress
	Maintain an annual overall chemical inventory reconciliation of >90%	Update HMM processes to maintain the reconciliation "found rate"	In Progress
	In FY08, reduce the SNL/CA site gas cylinder inventory by 10%, by container count, from the Oct. 1, 2007 baseline.	Lead an site-wide campaign to reduce 10% of the gas cylinders	In Progress

Appendix A. Personnel Assignments

Table 9. HMM Program Assignments

Job Assignment	Personnel	Back-Up
Program Lead	Mark Brynildson	Randy Castillo/Robert Holland
Program Technologist	Susie Orth	Pam Irish
Student Intern	Rebeccah Shermesser	None
Student Intern	None	None

Appendix B. Hazardous Materials Management Program Risk Assessment

Hazardous Materials Management Program Risk Assessment (Jan 2008)

The risk assessment process for the Hazardous Materials Management Program follows the general steps of

1. Identify the risk
2. Identify the probability of the event occurring
3. Identify the consequence if the event occurs.

The following tables will be used to assign a numeric value to the probabilities and consequence categories.

Likelihood/Probability Of Occurrence Level	Likelihood/Probability Criteria
Very High	• *Everything points to this occurring*
High	• *High chance - Lack of relevant processes or experience contribute to a high chance of occurrence*
Medium	• *Even chance of occurrence*
Low	• *Not much of a chance of occurrence*
Negligible	• Negligible chance this will occur

CONSEQUENCE/ SEVERITY LEVEL	CONSEQUENCE/SEVERITY CRITERIA
High	*damage (e.g., ozone depletion, rad soil contamination) • Serious environmental impact resulting in recovery actions lasting 5 years or more (e.g., TCE in aquifer) • Results in General Emergency (affects both onsite and offsite) • Unsatisfactory rating by external regulators or cease and desist order • Affects lab leadership, including prime contract • Actions, inactions or events that pose the most serious threats to national security interests and/or critical DOE assets, create serious security situations, or could result in deaths in the workforce or general public (i.e., IMI-1) ₁ • Actions, inactions or events that pose threats to national security interests and/or critical DOE assets or that potentially create dangerous situations (i.e., IMI-2) † • Unallowable costs or fines >$1M • Adverse public opinion – high interest/widespread open public attention or debate (lasting weeks to months) • Customer dissatisfaction results in permanent loss of lab customer • Catastrophic failure to meet internal requirements* • Loss of major program within the division (>$10M)

Medium	*• Has the potential for adverse impact on Sandia's programmatic performance or the achievement of corporate strategic or operational objectives • Significant injury/illness -fully recoverable with a long recovery time • Significant environmental impact resulting in recovery actions lasting up to 5 years (e.g., major oil spill) • Results in Site/Area Emergency (affects multiple onsite facilities) • One of regulator "hot buttons" (e.g., NNSA, NMED) • Results in increased oversight of limited number of functions • Actions, inactions, or events that pose threats to DOE security interests or that potentially degrade the overall effectiveness of DOE's safeguards and security protection program (i.e., IMI-3) † • Unallowable costs or fines >$500K and <$1M • Adverse public opinion – moderate interest, limited PR problems of short duration (days) • Customer dissatisfaction results in partial loss of program • Significant failure to meet internal requirements* • Loss of program within division (>$1M)
Low	*• Minimal injury/illness – Fully recoverable with a short recovery time • Minimal environmental impact that can be improved within days • Results in increased short-term oversight • Results in an Operational Emergency (affects a single onsite facility) • Actions, inactions, or events that could pose threats to DOE by adversely impacting the ability of organizations to protect DOE safeguards and security interests (i.e., IMI-4) † • Unallowable costs or fines <$500K • Adverse public opinion with short-term local negative publicity or embarrassment*
Negligible	• Little or no attention, might be discussed as lesson learned

The risk level will be graded according to the following matrix. Adapted from DOE O 471.4.

RISK GRADING LEVELS					
		Consequence/Severity			
		Negligible	***Low***	***Medium***	***High***
Likelihood of Occurrence	***Very High***	*Low*	*Medium*	*High*	*High*
	High	*Low*	*Medium*	*High*	*High*
	Medium	*Low*	*Medium*	*Medium*	*High*
	Low	*Low*	*Low*	*Low*	*Medium*
	Negligible	*Low*	*Low*	*Low*	*Low*

Identified Risks Associated with the Hazardous Materials Management Program

1. **Hazardous materials not being tracked in CIS**
2. **Aging chemicals or containers**
3. **Hazardous materials misidentified in CIS**
4. **Storage compatibility**
5. **Excess Inventory**
6. **Site-wide Earthquake Induced Spill or Accident**
7. **Reduction in Program Funding by 10%**
8. **Regulatory Noncompliance**

1. Hazardous materials not being tracked in CIS

a. **Identification of Risk**

There are two methods whereby hazardous materials may come on-site and not be entered into the CIS database. These are 1) hazardous materials are purchased off-site and hand-carried on-site by the purchaser, and 2) hazardous materials arriving at shipping and receiving are not clearly marked as such, and are thus delivered directly to the customer's location.

b. Probability of Occurrence

The probability is low for high risk items (higher hazard), since these items can not usually be purchased at local retailers. Higher hazard items are also usually clearly identified on shipping containers. The probability for low hazard materials is fairly significant, since not all members of the workforce are aware of the universe of materials tracked by CIS. Therefore, the overall probability is graded as LOW.

c. Consequence of Occurrence

If materials are not included in CIS, it is possible that they will be stored in areas not authorized for that material. Another risk is the exceedance of the safety envelop for a specific location. This could result in a change to emergency response protocols for that facility. The consequence is graded as LOW.

d. Overall Risk Category

In accordance with the chart above, for a risk with a probability of LOW with a LOW consequence, the risk category is **LOW.**

2. Aging chemicals or containers

a. Identification of Risk

Some chemicals become unstable with age. Examples are chemicals such as ethers that for explosive peroxides with aging.

Certain chemical containers deteriorate with age, causing a spill hazard.

b. Probability of Occurrence

The Hazardous Materials Management Program tracks the age of chemicals that form explosive compounds with age. Notices are sent to owners reminding them to remove such chemicals before they become a hazard. Approximately 20 containers per year are dealt with in this fashion.

Deteriorating containers are minimized through the efforts of the Hazardous Materials Management Program to minimize old, unused chemicals on-site.

These processes are partially manual, in that although the CIS can generate reports on age of chemicals, Hazardous Materials Management Program personnel must then manually send notices to the owners.

The probability of this risk is graded as MEDIUM.

c. Consequence of Occurrence

Aging chemicals pose a potential explosion or spill hazard. Consequences of an explosion or spill are mitigated by the fact that only small containers are typically purchased, and that they are stored in appropriate locations. The consequence is graded as LOW.

d. Overall Risk Category

In accordance with the chart above, for a risk with a probability of MEDIUM and a LOW consequence, the risk category is **MEDIUM.**

3. Hazardous materials misidentified in CIS

a. Identification of Risk

Chemicals are occasionally found to be misidentified in CIS. Usually the misidentification occurs when the CIS bar-code label is attached to the chemical bottle (e.g. the bar code label for a different bottle is accidentally attached).

b. Probability of Occurrence

A few containers per year are found to be misidentified; therefore the probability is graded as LOW.

c. Consequence of Occurrence

Misidentification in CIS does not imply that the user is not aware of the true identity of the chemical. However, the CIS database will be incorrect until the item is caught and corrected. This can lead to improper storage or the exceedance of safety envelopes, as noted above in item 1.

The consequence of this is graded as LOW.

d. **Overall Risk Category**

In accordance with the chart above, for a risk with a probability of LOW and a LOW consequence, the risk category is **LOW.**

4. Storage incompatibility

a. Identification of Risk

Given the large number of chemicals on-site, there is a risk of incompatible chemicals being stored in proximity to each other.

b. Probability of Occurrence

During the reconciliation process, it has been determined that although most chemicals on-site are stored properly, a few problems can be found in most areas where large numbers of chemicals are stored. The probability is graded as MEDUIM.

c. Consequence of Occurrence

Only small quantities of the most hazardous materials are purchased and stored. Storage within chemical sheds, or other types of secondary containment serves to minimize the amount of incompatible materials subject to mixing. The consequence is graded as LOW.

d. Overall Risk Category

In accordance with the chart above, for a risk with a probability of MEDIUM and a LOW consequence, the risk category is **MEDIUM.**

5. Excess Inventory

a. Identification of Risk

If the inventory of certain hazardous materials exceeds a regulatory threshold, SNL/CA would be required to prepare and implement an Emergency Management Program. Also, excess inventory poses an increased risk during an accidental release to personnel and the environment. Periodic surveillance of the inventory for chemical safety concerns such as explosive forming peroxidizables and autopolymerizable materials minimizes this higher risk inventory. Annual reconciliation of the inventory provides a review of the general condition of all containers and the storage conditions of these materials to minimize the risk of container failure and incompatible storage.

b. Probability of Occurrence

Given that the nature of SNL/CA's business entails the use of some extremely hazardous materials, and given the very low thresholds of some of these materials for requiring an Emergency Management Hazards Assessment, the probability of being required to prepare and implement an Emergency Management Hazardous Materials Program is considered to be High. Chemical safety issues relating to improper storage or the accidental release of hazardous materials impacting personnel and/or the environment from excess inventory is also considered to have a HIGH probability of occurrence.

c. Consequence of Occurrence

The preparation and implementation of a site-wide Emergency Management Hazardous Materials Program would very likely entail costs in the range of several hundred thousand dollars per year. These costs would be primarily borne by the Site Operations Center, since most of the activities would be carried out by the Security Operations Department and the ES&H departments. This cost would be less than 5% of the Site Operations budget ($42.6 million in 2005), so the consequence assigned is LOW.

d. Overall Risk Category

In accordance with the chart above, for a risk with a probability of High and a Low consequence, the risk category is **MEDIUM.**

6. Site-wide Earthquake Induced Spill or Accident

a. Identification of Risk

Incidents, such as spills and fires are not unknown due to earthquakes at facilities.

b. Probability of Occurrence

Given the recent history, the probability of occurrence is considered Low that an earthquake of sizable magnitude will occur affecting SNL/CA at some time during

the lifetime of the SNL/CA facility. A moderate earthquake in 1981 cause significant damage to SNL/CA include minor chemical spillage.

c. Consequence of Occurrence

SNL/CA would be responsible for the on-site clean-up and cost of waste disposal. A post cleanup inventory reconciliation would be required to verify the accuracy of the remaining inventory costing about $50k would be required. It is assumed that the dollar amount of the SNL/CA liability would be less than 1% of the SNL/CA annual operating budget ($220 million in FY 2006), therefore the consequence is Low.

d. Overall Risk Category

In accordance with the chart above, for a risk with a probability of Low, with a Medium severity, the risk category is **LOW.**

7. Reduction in Program Funding by 10%

a. Identification of Risk

SNL/CA is experiencing pressure to reduce expenses for indirect-funded and direct-funded organizations, including Environmental Management. Because the majority of Waste Management Program expenditures are for labor, a 10% reduction in funding would impact staffing. A reduction in staffing would result in a reduced level of service to line organizations.

b. Probability of Occurrence

Increasing constraints on site budgets is expected to continue for the next several years. Consequently the probability that funding for the Hazardous Materials Management Program will decrease by 10% from FY 2007 levels is Medium.

c. Consequence of Occurrence

A 10% reduction in program funding would result in decreased staffing, training, and purchases. Only those program activities that are required by regulation, Sandia policy, technical work documents, or DOE/NNSA would be conducted. Discretionary training and travel for program staff would be eliminated. Purchases for replacement equipment and equipment repair would be reduced. A reduction in Line training and support would occur.

An occurrence could occur as a result Line under compliance and documentation inaccuracies. For these reasons, the consequence of a 10% reduction in program funding is identified as Medium.

d. Overall Risk Category

In accordance with the chart above, for a risk with a probability of Medium, with a Low severity, the risk category is **MEDIUM.**

8. Regulatory Noncompliance

a. Identification of Risk

The Hazardous Material Management Program was identified during a November 2007 Lockheed Martin ES&H Assessment to be under reporting Lead Acid Batteries in the annual EPCRA 312 reports. This situation has been corrected by the inclusion of UPS and equipment Lead Acid Batteries in CIS. This information will now be reported correctly in future EPCRA 312 reports beginning in CY2007. The remaining identified risk is related to the potential fines and negative publicity.

b. Probability of Occurrence

The probability of an EPA or Alameda County audit resulting in a fine and/or negative publicity is Low.

c. Consequence of Occurrence

The consequence of a fine and/or negative publicity would likely be an "Unallowable cost or fine <$500K" and the "adverse pubic opinion would be short-term local negative publicity or embarrassment". Therefore, the consequence is identified as Low.

d. Overall Risk Category

In accordance with the chart above, for a risk with a probability of Low, with a Low severity, the risk category is **LOW.**

Appendix C. Hazardous Materials Management Quality Significant Purchases Determination

Sandia National Laboratories

Operated for the U.S. Department of
Energy by Sandia Corporation
Livermore, California 94551-0969

date: March 24, 2006

to: Gary Shamber, 8516
Manager, Environmental Management Department

from: Mark Brynildson, 8516
Hazardous Material Management Program Lead

subject: Quality Significant Purchases

1.Program title. Hazardous Material Management Program

2. Risk level of the program: The highest risk level was determined to be medium.

3. Types of material/instruments/equipment used in the program:

- PPE
- Communication devices (phones & pagers)
- Barcodes and Barcode Scanners
- CIS database
- Desktop computers and printers

4. Criteria used to evaluate these to determine quality significance:

A potential failure of the items listed was evaluated against corporate quality-significant criteria. It was determined that such a failure:

- Will not cause a significant adverse impact to program cost, schedule, or performance in the event of a failure;
- Will not significantly impact the safe operation of a facility or activity;
- Will not involve the use, handling, or storage of radioactive material or radiation-generating devices, or involve exposure to ionizing radiation;
- Do not relate to the design, analysis, manufacture, or assembly of hardware, equipment, and software for present or future use with radioactive material;
- Will not be used in any safety-significant or safety-critical system, component, or application whose failure could adversely affect people, property, or the environment.

5. Determination on quality significant items: The Hazardous Material Management Program does not have any quality significant items.

6. Determination on S/CI concerns/issues: The Hazardous Material Management Program does not have items that have the potential for suspect/counterfeit items that would be of a concern to the program.

Appendix D. Hazardous Materials Management Program Self Assessment

Self Assessment Report

EMS Hazardous Materials Management Program SA

Assessment Number: 2327

Assessment Type: Line

Assessment Dates:
09/04/2007 - 12/13/2007

Prepared by:

BRYNILDSON,MARK E. 12/04/2007

Phone: 9252943150

Org: 08516

Section 1 *Executive Summary*

1.1 Who/What was assessed

The Hazardous Material Management Program 2007 Assessment focused on the SNL/CA Chemical Safety and Lifecycle Management (CLMS) requirements and guidelines.

1.2 Overview of Scope

The assessment included reviewing the changes made to the Hazardous Materials Procurement Controls and the integration of the Emergency Management Hazards Survey. In addition, the 2005, 2006, and 2007 Chemical Inventory Reduction Campaigns was assessed for process improvements and lessons learned. Staff also conducted a Programmatic Document Review.

1.3 Why Assessment was performed

This was a routine Hazardous Materials Management Program self-assessment.

1.4 The Assessment resulted in the following:

0 Significant Finding(s)
0 Minor Finding(s)
2 Observation(s)
1 Noteworthy Practice(s)
3 None - Acceptable Practice(s)

The assessment resulted in two observations. The HMMP team should work with GSS and Fisher to continue to streamline the chemical procurement process for the Line. In addition, information on Chemical Procurement needs to be added to the CIS website. The Bio-Safety Committee and/or Officer should review the Biological Material Receiving Notification process.

The HMMP team needs to continue to review and update the MSDS library. This includes finding the NFPA ratings when they are available, finding missing MSDSs, and having MDL review their MSDS when needed. In addition, the HMMP team will need to pay closer attention when matching the MSDS to the container information.

1.5 What happens next

The Hazardous Materials Management Program will continue to work on improving the CIS database.

1.6 Who to contact if there are questions

Not Specified

Section 2 *Introduction*

2.1 Background

Not Specified

2.2 Purpose of assessment

To assess the SNL/CA Chemical Safety and Lifecycle Management (CSLM) requirements and guidelines designed to manage inventory procurement, hazard, and age.

2.3 Location(s) Assessed

None

2.4 Planning Documents Reviewed

PHS

Paper Checklists

2.5 Scope/Criteria

ES&H » Industrial Hygiene » Chemical Barcoding & Inventory
ES&H » Industrial Hygiene » Chemical Information System
ES&H » Emergency Management » Hazards Surveys and Hazards Assessments
ES&H » Environmental Protection » Environmental Management System

Section 3 *Assessment Performance*

3.1 Assessment Team Members

Name	Org.	Role
ORTH,SUSANNE	08516	Lead Assessor
BRYNILDSON,MARK E.	08516	POC Assessed
CHOI,MABLE	08524	Creator

3.2 Personnel Interviewed

None

3.3 Documents Reviewed

Document	Number	Description	Revision	Type	Date of Review
CAA RMP/CalARP Compliance Review for SNL/CA	none	Clean Air Act Risk Management Plan/California Accidental Release Prevention	2007	Memo	12/10/2007

Notes: OP471758 issue C is being reviewed and has to be completed by 01/17/2008.

CAA RMP/CalARP Compliance Review for SNL/CA	none	Clean Air Act Risk Management Plan/California Accidental Release Prevention (CalARP) Compliance Revi	2007	Memo	12/10/2007

Notes: The Compliance Review of the CAA RMP/CalARP confirms SNL/CA is under the reporting thresholds.

Hazardous Material Management Program webpages		Hazardous Material Management Program webpages		Webpage	12/03/2007

CIS Homepage		CIS Homepage		Webpage	12/03/2007

Notes: Application Version: Release 1.0.30, Last Modified: November 20, 2007

CIS Forms		CIS Forms		Forms	12/03/2007

Notes: Static Inventory Form Gas Cylinder Form Chemical Inventory Incoming Form Biological Agent Inventory Form Location Description Form Chemical Transfer/Disposal Form

Hazardous Material Management Handbook		Hazardous Material Management Handbook		Document	12/03/2007

Notes: Will be updated by 05/2008.

ES&H Manual Section 10J	MS471001	Registering, Naming, and Labeling bulk	A	Webpage	12/03/2007

storage tanks

CIS Program Plan	PG470198	CIS Program Plan	B	Document	12/03/2007

Notes: Document is in the process of being reviewed and updated.

ES&H Manual Section 6U (Chemical Inventory Procedu	MN471001	ES&H Manual Section 6U	C	Webpage	09/12/2007

Notes: Document was just updated and is in the process of being updated again.

CIS/HMMP Annual Reconciliation Procedures	AP800003	CIS/HMMP Annual Reconciliation Procedures	B	Process Procedures	12/03/2007
Hazardous Material Management Program Operations	SNL0A00433-011	PHS	H	PHS	10/23/2007

3.4 Definitions

Finding: A statement of fact based on objective evidence documenting an act or condition that does not meet requirements, policies, or procedures required by law, a regulatory agency, DOE, Sandia CPR, or a formally-invoked, site-specific, standard.

Significant Finding:
From self-assessments, any Finding that rate High or Medium in risk level (probability of occurrence and consequence criteria per the Enterprise Risk Management CPR) and requires formal causal analysis, corrective action planning, verification, and entry into CATS.

Additionally, any:
Issues (Findings) from Sandia's Independent Audit and Advisory Services Center;
Findings from internal, independent assessments (e.g., Weapon Quality Assessment.);
Issue identified as a corporate issue through the Corporate Issues Management Process.

Minor Finding: Any Finding from self-assessments that rate Low in risk level (probability of occurrence and consequence criteria per the Enterprise Risk Management CPR).

Observation: A statement of fact based on objective evidence documenting an act or condition that does not violate a requirement but may need improvement.

Noteworthy Practice: A process or condition indicating exceptional or innovative policy, practice, or performance.

None - Acceptable Practice: A process or condition with no observed problems.

Section 4 *Significant Findings*

This Assessment resulted in 0 Significant Finding(s).

Section 5 *Minor Findings*

This Assessment resulted in 0 Minor Finding(s).

Section 6 *Observations*

This Assessment resulted in 2 Observation(s).

Observation No. 1

Starting March 2007 procurement changed the process of ordering hazardous materials at SNL/CA. Hazardous Materials can no longer be purchased on procurements cards unless the hazardous material exception form has been filled out and approved. The Line can place orders via Fisher Scientific, Government Scientific Sources (GSS), or the site procurement department. The process for ordering gases should still be completed through the JIT vendor Matheson/Tri-Gas. Aside from gases, all hazardous materials purchased are barcoded by the HMMP team in the receiving building 928. By physically barcoding the hazardous material containers, the HMMP team has a hands on view of the incoming materials on a daily basis. From the procurement changes that have been implemented, the HMMP and Emergency Management reviews and approves the hazardous material orders that are place through Fisher, GSS, and the Procurement department. With the addition of this approval process, HMMP and Emergency Management can monitor the hazardous materials being purchased prior to them being delivered onsite. This is a significant improvement to the prior procurement process at SNL/CA. The downside to this process is that Fisher and GSS are not fully integrated with each other. From the Line's prospective, they have mixed feelings about the new procurement process. With some of the Line appreciating these new processes, others would prefer that ordering process be reverted back to just the simple procurement-card purchasing. The Line has felt that both Fisher and GSS are overpriced, very cumbersome, and they do not provide adequate feedback/confirmation information. HMMP should forward the Line's feedback to Fisher/GSS and SNL/CA procurement to help streamline these new procurement processes. HMMP team has used the Biological Material Receiving Notification website to know when a biological material is expected to be received at SNL/CA. This pre-notification is a useful tool to the Bio-Safety process, HMMP, receiving, and the Line. However, the Biological Material Receiving Notification website is no longer working properly. Information can be entered into this webpage, but no email notification is being sent out in return. The Bio-Safety Committee and/or Officer needs to determine if there is a need for the Biological Material Receiving Notification process.

Trending Code: Procurement

Result Location(s):

None

Result Criteria: ES&H » Industrial Hygiene » Chemical Information System

Observation No. 2

With the changes to the DOE Order 151.1C, Emergency Management has contracted AlphaTRAC to provide planning threshold screening data to HMMP. This data AlphaTRAC provides to HMMP is used to assess the CIS database for exceedances in the planning thresholds. The Emergency Management team in SNL/NM performs a monthly surveillance of the exceedances in CIS. Review of this data has shown that CIS does not have a complete MSDS data set, the MDL MSDS's have errors in the NFPA codes, and for some containers the proper MSDS was not identified by HMMP team. The HMMP team needs to continue to review and update the MSDS library. This includes finding the NFPA ratings when they are available, finding missing MSDSs, and having MDL review their MSDS when needed. In addition, the HMMP team will need to pay closer attention when matching the MSDS to the container information.

Trending Code: Work Processes

Result Location(s):

None

Result Criteria: ES&H » Industrial Hygiene » Chemical Information System

Section *7 Noteworthy Practices*

This Assessment resulted in 1 Noteworthy Practice(s).

Noteworthy Practice No. 1

Over the past three years (2005, 2006, 2007), EMS has set goals for SNL/CA to reduce the hazardous materials onsite. In 2005, SNL/CA goal was to reduce the hazardous material inventory by 10% (by container count). That year SNL/CA achieved a 15% inventory reduction. The HMMP team sent out monthly department level statistics to show each department's reduction percent. The monthly department statistics were criticized both negatively and positively for displaying individual

departments' reduction efforts when the reduction goal was a site-wide effort. The following year, 2006, SNL/CA goal was to reduce the hazardous material inventory for NFPA Health Hazard rated (NFPA HH) 3 and 4 material greater than 10 years old by 5%. With Waste Management contribution, this goal was not only accomplished but was exceeded by reducing the inventory for NFPA HH rated 3 and 4?s by 12%. During this campaign, Waste Management provided some funding to the each Organization which helped offset some of the disposal costs. The success of this campaign came from the additional funding from Waste Management, since several departments claimed that they did not have the funding to reduce their inventory for a second year in a row. This past year's hazardous material reduction focused on reducing 8700 hazardous material inventory for NFPA HH rated 3 and 4 material greater than 10 years old by 20%. With Tim Shepodd (Line Manager in 8700) leading the reduction efforts, 8700 exceeded this goal by reducing their inventory by 29% for NFPA HH rated 3 and 4 material. The active involvement of a direct Line Manger helped to contribute to the success of this campaign. This campaign did highlight several issues within CIS. These issues consisted of improper labeling of older containers and the lack of space ownership. HMMP corrected the improper labeling issue that was discovered by verify each of those containers. In addition, the HMMP had difficulty identifying ownership of old expired containers when the space had been transferred from one department to another. To help minimize this problem in the future, HMMP will need to continue to send email notifications to Line Managers when an individual leaves SNL/CA and their department has expired hazardous materials. HMMP needs to be notified when the space ownership changes to help minimize amount of legacy hazardous materials left behind. In comparing the campaigns over the past three years, aside from the each year's goal there were slight variations in the campaign process. Department personnel were asked to review the email notifications of their hazardous materials and to properly dispose of all unneeded hazardous materials through Waste Management. Statistics were sent out to department managers showing each department's reduction effort. The main difference in each of these campaigns was the driver. In 2005, the efforts by the HMMP team helped to surpass the inventory reduction goal by 5%. While the contribution of Waste Management helped to exceed the inventory reduction goal by 7% in 2006. The Line manager's participation in the 2007 inventory reduction campaign led to goal being exceeded by 9%.

Result Location(s):

None

Result Criteria: ES&H » Industrial Hygiene » Chemical Information System

Section 8 *None - Acceptable Practices*

This Assessment resulted in 3 None - Acceptable Practice(s).

None - Acceptable Practice No. 1

The Hazardous Materials Management Program documents (PHS, administrative procedure, operating procedure, forms, web pages, ES&H Manual Section 10J, and the CIS program Plan) have been reviewed and updated as needed. The ES&H Manual section 6U Chemical Barcoding and Inventory was reviewed and updated in August 2006. The updated document states the updated requirements of the chemical inventory responsibilities. These requirements include the rotation of stock, limiting chemical inventory quantities to what is required for the process, and avoiding excess ordering. In addition, updates were made in all the sections of this document. The updates better define the requirements of the chemical inventory process. The ES&H Manual Section 6U Chemical Barcoding and Inventory should be communicated to the Line the significant number of updates.

None - Acceptable Practice No. 2

CAA RMP/CalARP Annual Review was completed and documented using CIS data on 8/24/2007 by the Hazardous Materials Management Program. The results confirm that SNL/CA does not have chemicals regulated by the CAA RMP/CalARP in sufficient quantities to exceed reporting threshold limits.

None - Acceptable Practice No. 3

The corporate internal audit organization, 12870, completed an audit of the corporate CIS (including the Hazardous Materials Management Program at SNL/CA) in December 2007. The Lead Auditor was Richard Bild. The audit closeout on 12/5/2007 reported the Corporate Chemical

Information System (CIS) Program to be "Satisfactory - No issues found, or one or more isolated occurrences of minor issue". The final report has not been released but the draft report indicated there was only on minor issue, 5 comments and 4 Noteworthy Practices. This audit and associated corrective action plan will be tracked independently in CATS.

Section 9 *Improvement Action Details*

Observation No. 1

Result Criteria: ES&H » Industrial Hygiene » Chemical Information System

There are no Improvement Actions

Observation No. 2

With the changes to the DOE Order 151.1C, Emergency Management has contracted AlphaTRAC to provide planning threshold screening data to HMMP. This data AlphaTRAC provides to HMMP is used to assess the CIS database for exceedances in the planning thresholds. The Emergency Management team in SNL/NM performs a monthly surveillance of the exceedances in CIS. Review of this data has shown that CIS does not have a complete MSDS data set, the MDL MSDSs have errors in the NFPA codes, and for some containers the proper MSDS was not identified by HMMP team. The HMMP team needs to continue to review and update the MSDS library. This includes finding the NFPA ratings when they are available, finding missing MSDSs, and having MDL review their MSDS when needed. In addition, the HMMP team will need to pay closer attention when matching the MSDS to the container information.

Result Criteria: ES&H » Industrial Hygiene » Chemical Information System

There are no Improvement Actions

return. The Bio-Safety Committee and/or Officer needs to determine if there is a need for the Biological Material Receiving Notification process.

Result Criteria: ES&H » Industrial Hygiene » Chemical Information System

There are no Improvement Actions

Observation No. 2

With the changes to the DOE Order 151.1C, Emergency Management has contracted AlphaTRAC to provide planning threshold screening data to HMMP. This data AlphaTRAC provides to HMMP is used to assess the CIS database for exceedances in the planning thresholds. The Emergency Management team in SNL/NM performs a monthly surveillance of the exceedances in CIS. Review of this data has shown that CIS does not have a complete MSDS data set, the MDL MSDSs have errors in the NFPA codes, and for some containers the proper MSDS was not identified by HMMP team. The HMMP team needs to continue to review and update the MSDS library. This includes finding the NFPA ratings when they are available, finding missing MSDSs, and having MDL review their MSDS when needed. In addition, the HMMP team will need to pay closer attention when matching the MSDS to the container information.

Result Criteria: ES&H » Industrial Hygiene » Chemical Information System

There are no Improvement Actions